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September 15, 2009

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

**Re: Ex Parte Filing
WT Docket No. 07-293; IB Docket No. 95-91;
GEN Docket No. 90-357**

Dear Ms. Dortch:

This is to confirm that yesterday, September 14, 2009, the undersigned, together with Giselle Creeser, Lockheed Martin Corporation; Marc Ehudin, Textron, Inc.; Bruce Olcott, Squire Sanders and Dempsey; and Daniel G. Jablonski, Ph.D., Johns Hopkins University Applied Physics Lab, met with Julius P. Knapp, Chief, Office of Engineering and Technology ("OET"); Ira Keltz, Ron Repasi, and Alan Stilwell, Deputy Chiefs, OET; Bruce Romano, Associate Chief; Geraldine Matise, Chief, Policy & Rules Division, OET; Patrick Forster, OET; and John Kennedy, OET, regarding the position of Aerospace and Flight Test Radio Coordinating Council ("AFTRCC") in the above-referenced proceedings.

Separately, Messrs. Ehudin, Olcott, Jablonski and I met with John Giusti, Chief of Staff to Commissioner Copps, and Paul Murray, Legal Adviser to the Commissioner, regarding the same subject.

The AFTRCC representatives distributed the material attached. The points covered during the meetings are reflected in those materials, as well as in AFTRCC's earlier filings in the Dockets.

In addition, the AFTRCC representatives observed that it was not possible for aeronautical mobile telemetry ("AMT") to filter Wireless Communications Service ("WCS") out-of-band emissions ("OOBE") without filtering out the very signal desired to be received; that AFTRCC had submitted data demonstrating that economical filters could be employed for WCS mobile devices, but that another effective option for aviation safety would be to limit use of the 2345-2360 MHz half of the WCS spectrum to the Fixed allocation; that this outcome would protect both AMT and SDARS while still supporting the agency's broadband objectives; and that the WCS request to change the Rules from measurement of OOBE on a peak power basis to

Duane Morris

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measuring OOB on an average power basis, given 13 dB excursions, would greatly aggravate the risk of harmful interference.

A copy of this ex parte statement is being submitted for the record in above-referenced proceedings.

Sincerely,

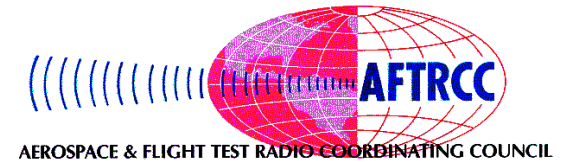
A handwritten signature in black ink, appearing to read "William K. Keane", with a long horizontal flourish extending to the right.

William K. Keane

WKK:sml

cc: Julius P. Knapp
Ira Keltz
Ron Repasi
Alan Stilwell
Bruce Romano
Geraldine Matisse
Patrick Forster
John Kennedy

John Giusti
Paul Murray



Aerospace and Flight Test Radio Coordinating Council (AFTRCC)

"Impact to Flight Test Safety of WCS Proposals "

Presentation in
WT Docket No. 07-293 and
IB Docket No. 95-91

September 14, 2009

Aerospace and Flight Test Radio Coordinating Council Members



BOMBARDIER



NORTHROP GRUMMAN



Raytheon

Electronic Sensors & Systems Sector

**Rockwell
Collins**



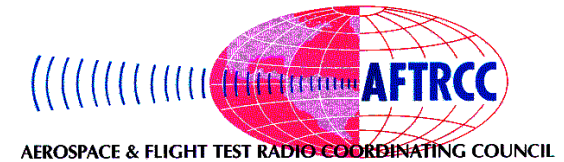
Bechtel Nevada



L3 Telemetry East



Characteristics of Telemetry in the 2360-2390 MHz Band



- Band utilized for testing aircraft and missiles.
- Telemetry transmitted over distances of 200 miles to highly sensitive parabolic antennas, typically mounted on towers, buildings, or mobile vans.
- Telemetry measures a multitude of parameters from engine temperature, to fluid pressures, to vibration levels, to name a few.
- Data is telemetered to ground engineers who 1) monitor the performance of the aircraft on a real-time basis and 2) warn the pilot of any trouble detected.
- Signal levels are weak and subject to dramatic fades due to maneuvers of test aircraft and multipath.
- Interference-free telemetry is vital to flight safety in an inherently dangerous operation, as well as to aerospace industry productivity.
- Hence, 2360-2390 MHz is a Restricted Band off-limits to fundamental emissions of all other services. Rule 15.205.

WCS Protection of Flight Testing

- WCS allocated in the 2305 – 2320 MHz and 2345 – 2360 MHz
- WCS OOB E has been limited to $43 + 10 \log (P)$ dB from band edge to 2370 MHz, and $70 + 10 \log (P)$ above 2370 MHz. However,
- WCS power is measured on peak basis per Rule 27.50(a); and
- The current OOB E limit into the SDARS band, 2320 – 2345 MHz ($110 + 10 \log (P)$ dB), has effectively precluded mobile use of the WCS band, and provided de facto protection to AMT.
- There has been little use of the band to date.

Results of WCS Field Tests



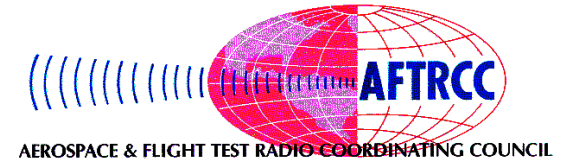
- Recent field tests of WCS devices have confirmed the interference threat.
- A low noise flight test telemetry receiver was tuned to a center frequency of 2362.5 MHz with a 12 MHz bandwidth (2356.5-2368.5 MHz).
- Test conducted at a distance of approximately 60 feet with an omnidirectional antenna having zero dB gain given (typical large AMT antenna not available).
- Despite the frequency separation (the WCS band edge was 2352.5 MHz), the WCS signal caused severe interference to the AMT receiver.
- If a typical, higher gain Aeronautical Mobile Telemetry antenna had been used for the test, the interference would have been experienced at over 11 miles – even farther had the antenna been tower-mounted as is usually the case.

WCS Proposals Will Adversely Impact Flight Testing



- WCS wants power measured on an average basis, not peak as required by Rule 27.50(a), with a peak-to-average ratio of 13 dB
- Measuring WCS power on an average basis -- much less allowing a peak-to-average ratio of 13 dB -- will significantly increase OOB into 2360-2370 MHz.
- Effectively relaxes the OOB limit from $43 + 10 \log(P)$ to only $30 + 10 \log(P)$.

WCS Proposals Will Adversely Impact Flight Testing (cont.)



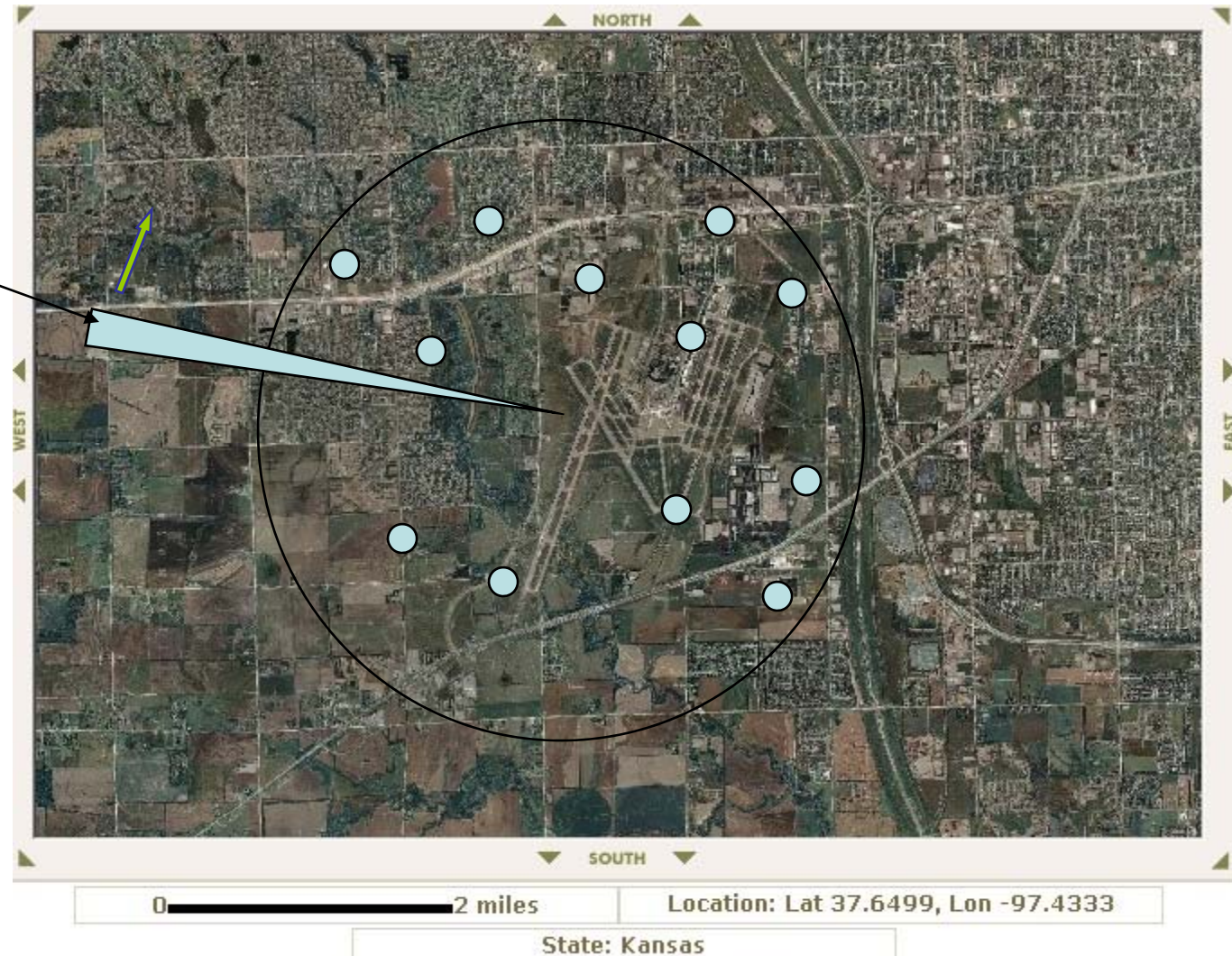
- *This would greatly increase the risk of telemetry drop-outs, and reduce maximum aircraft range by 30 percent . By operation of πr^2 , this results in a 51 percent reduction in reliable airspace operating area.*
- Aircraft are routinely required to operate out to maximum range from AMT ground stations in order to cope with FAA restrictions, weather conditions, local air traffic congestion, etc. That essential flexibility will be lost.
- Mission re-flights increase risk. Mission re-flights increase costs. Mission re-flights cause delivery delays, and reduce global competitiveness.

Impact to Flight Testing

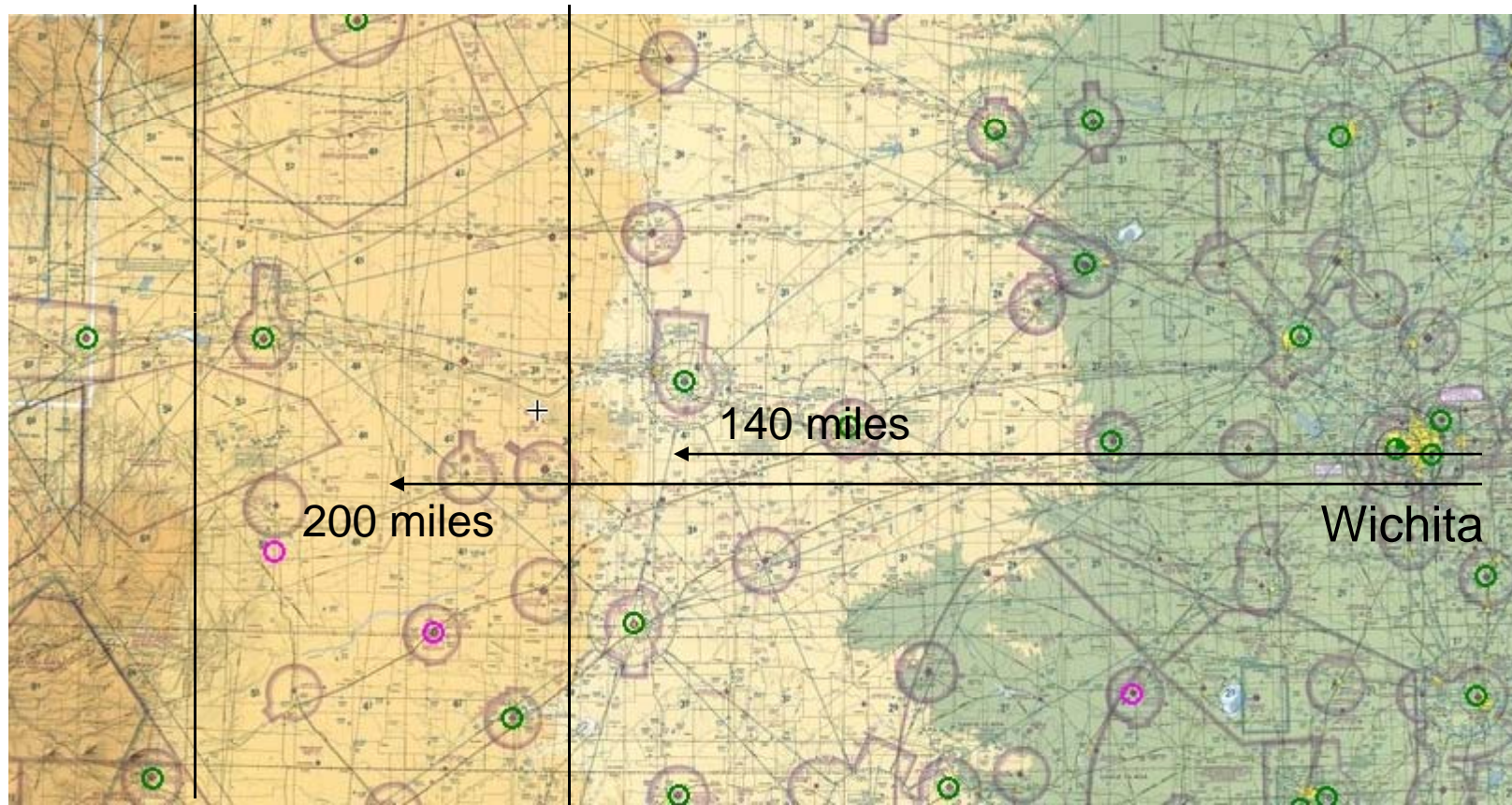


Geography near Wichita, Kansas showing possible WCS base station tower placement within 2 miles of Mid-Continent Airport, where Cessna, Learjet, and others conduct their flight tests

Beam of AMT receive antenna as it cuts across WCS towers and their associated portable and mobile terminals while tracking an aircraft

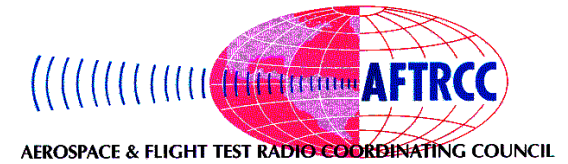


Impact to Flight Testing



Maximum operational distance near Wichita of 200 miles is reduced to 140 miles if WCS placement doubles the AMT noise floor.

FCC Has Repeatedly Recognized Protected Status for Flight Test Band

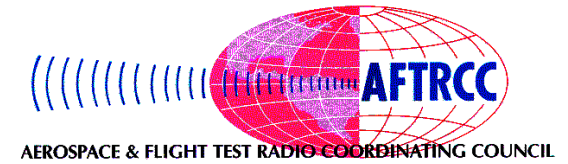


- Recognized that flight testing is a safety service which must be protected “from harmful interference that could result in loss of life.”^{1/}
- Determined that telemetry bands should be classified as “Restricted” and protected from fundamental emissions of unlicensed devices -- agency stressed that the telemetry band “involv[es] safety of life.” ^{2/}

^{1/} *In the Matter of Amendment of Part 2 of the Commission's Rules Regarding Implementation of the Final Acts of the World Administrative Radio Conference, Geneva, 1979.* FCC 84-306, released July 2, 1984, at 2.

^{2/} *In the Matter of Revision of Part 15 of the Rules Regarding the Operation of Radio Frequency Devices Without an Individual License*, 4 FCC Rcd 3493, 3502 (1989).

FCC Has Repeatedly Recognized Protected Status for Flight Test Band (cont.)



- Recognized potential cost to manufacturers and the taxpayer from even brief telemetry drop-outs is significant:

“[F]light test, telemetry, and telecommand operations are vital to the U.S. aerospace industry to produce, deliver, and operate safe and efficient aircraft and space vehicles.”^{3/}

^{3/} Second Notice of Inquiry in GEN. Docket No. 89-554, In the Matter Of An Inquiry Relating to Preparation for the International Telecommunication Union World Administrative Radio Conference for Dealing with Frequency Allocations in Certain Parts of the Spectrum, FCC 90-316, 5 FCC Rcd 6046, 6060, para. 101 (1990).

U.S. Has Protected Flight Test Band Internationally



- U.S. took extraordinary measures at WRC-07 to protect S-band telemetry:

“The United States of America and Canada refer to footnote number 5.394 of Article 5 of the Radio Regulations concerning the use of the 2 300-2 390 MHz band in the United States and the 2 300-2 400 MHz band in Canada and state that, in application of the Final Acts of the World Radiocommunications Conference (Geneva, 2007) in those bands, the aeronautical mobile service for telemetry has priority over other uses by the mobile services.”^{4/}

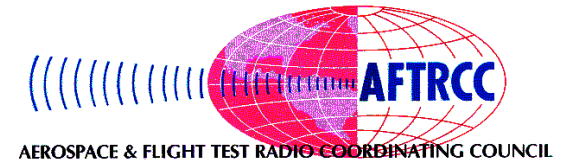
^{4/} Declaration No. 78, Document 427-E (WRC-07) (emphasis added).

WCS Arguments



- WCS argues that there is no change in the “nature of service,” i.e. fixed and mobile allocations and that AFTRCC participated in the rulemaking establishing the allocations.
 - But the allocations are not the issue -- it is the WCS attempt to change the service rules applicable to the allocations. This would entail an enormous change from a largely unused band, to a band potentially widely used. This can be accomplished without endangering a spectrum neighbor’s operations.
- WCS argues that it is not proposing to change the OOB Rule of $43 + 10 \log(P)$ dB
 - But it is proposing to change the Rule by which OOB compliance is measured (average versus peak power) -- exacerbating the interference to AMT.

WCS Arguments



- The same WCS parties opposed average power measurement when WCS Wireless sought a waiver just three years ago incident to a prospective merger with XM Satellite Radio. Quoted in AFTRCC ex parte of May 7, 2008 at 3.
- AT&T has argued that there should be a 10 MHz guardband to protect its operations at 2110-2155 MHz (AWS-1) from any adjacent interference from 2155-2180 MHz band (AWS-3). See AFTRCC ex parte of August 18, 2008.

AFTRCC Proposal Enhances Spectral Usage and Aviation Safety



- Retain peak power measurement consistent with existing Rule 27.50(a) and various other wireless services (1390-1392; 1390-1392/1432-1435 MHz; and 1670-1675 MHz; see Rules 27.50(e)-(f))
- Increase existing protection levels (from $43 + 10 \log (P)$ in 2360 – 2370 MHz and $70 + 10 \log (P)$ in 2370 – 2390 MHz) to
 - $70 + 10 \log (P)$ in 2360 - 2370 and $90 + 10 \log (P)$ in 2370 - 2390 MHz for mobiles and portables
 - $75 + 10 \log (P)$ before transmit antenna in 2360 -2370 MHz and $95 + 10 \log (P)$ in 2370 - 2390 MHz for base stations
- Require power control for WCS base stations, mobiles and portables
- AFTRCC's proposal will enable the FCC to 1) protect aviation safety and 2) increase the utility of the 2345-2360 MHz band.